NAME: DATE:

# Mastery Assessment of Unit 2 (Practice version 110)

### Question 1

Let $f$ represent a function. If $f[2] = 44$, then there exists a knowable solution to the equation below.

$$y = \frac{f\left[\frac{x-18}{12}\right]}{4} - 3$$

Find the solution.

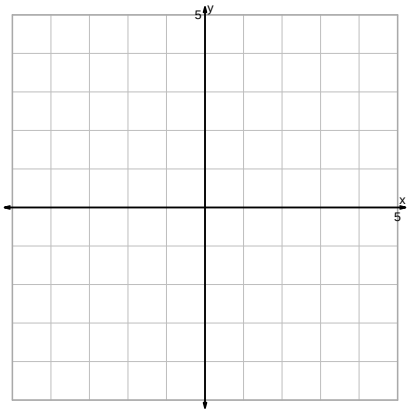
$x =$

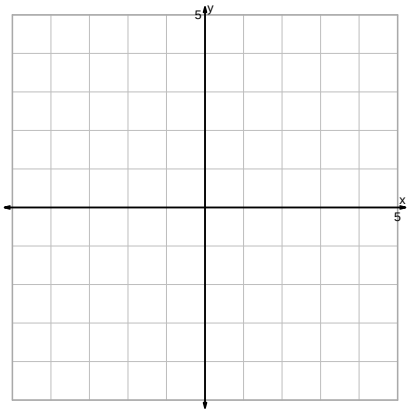
$y =$

### Question 2

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

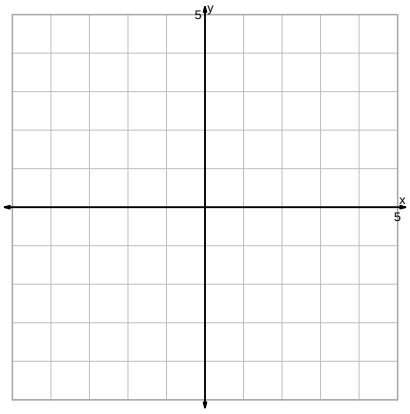
$y = 2 \cdot \sqrt{x}$

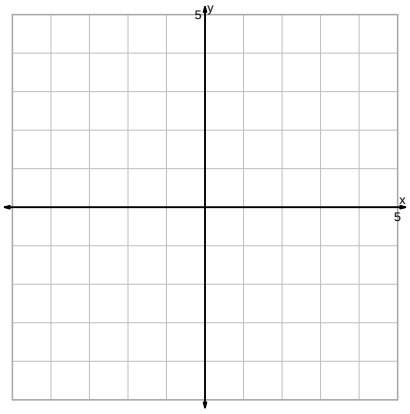



$y = -\log_2(x)$

$y = \sqrt[3]{x} - 2$

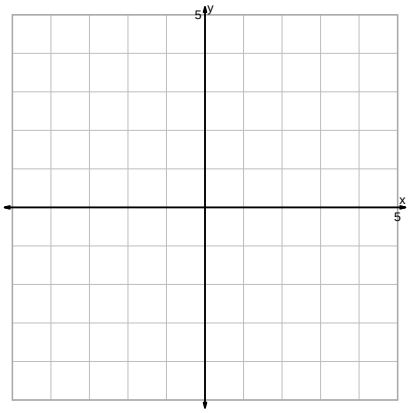


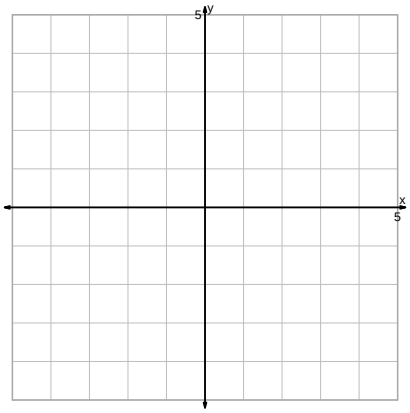




$y = (x-2)^3$

**Question 2 continued...**

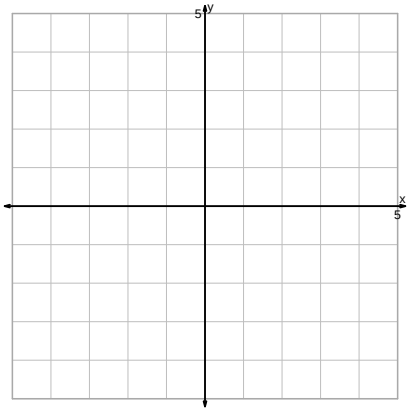
$y = \dfrac{\log_2(x)}{2}$

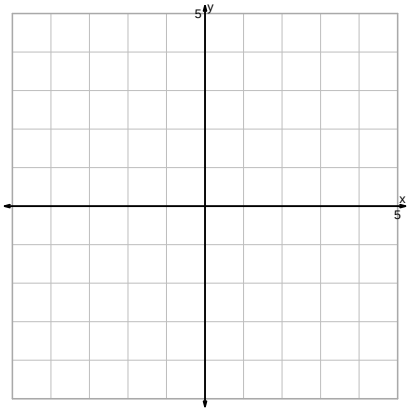



$y = (x+2)^2$

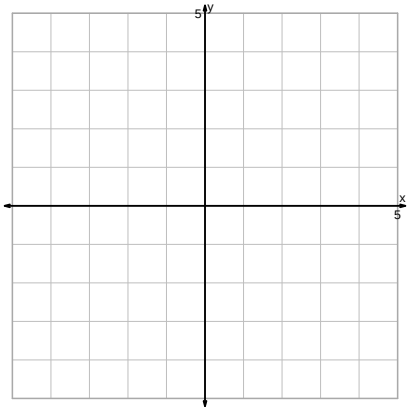
$y = \left(\dfrac{x}{2}\right)^2$

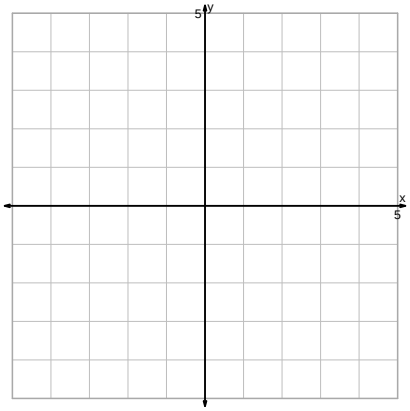



$y = 2^{2x}$

$y = x^3 + 2$

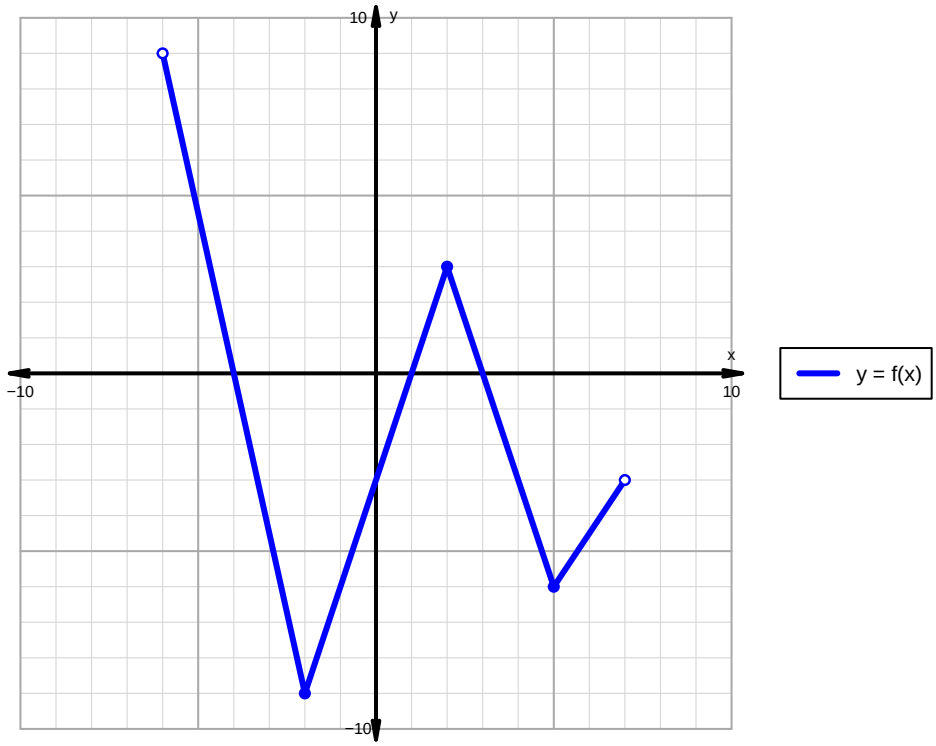



$y = \sqrt{-x}$

**Question 3**

A function is graphed below.



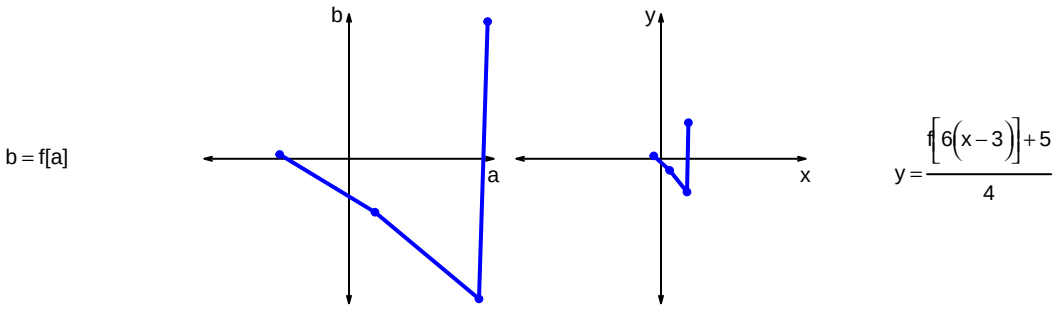

Indicate the following intervals using interval notation.

| Feature | Where |
|---|---|
| Positive | |
| Negative | |
| Increasing | |
| Decreasing | |
| Domain | |
| Range | |

**Question 4**

Let $f$ represent a function. The curves $b = f[a]$ and $y = \frac{f[6(x-3)]+5}{4}$ are represented below in a table and on graphs.

| a | b | x | y |
|---|---|---|---|
| -48 | 3 | -5 | 2 |
| 18 | -37 | 6 | -8 |
| 90 | -97 | 18 | -23 |
| 96 | 95 | 19 | 25 |




a. Write formulas for calculating $x$ from $a$ and calculating $y$ from $b$. (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = \frac{f[6(x-3)]+5}{4}$?

**Question 5**

A parent square-root function is transformed in the following ways:

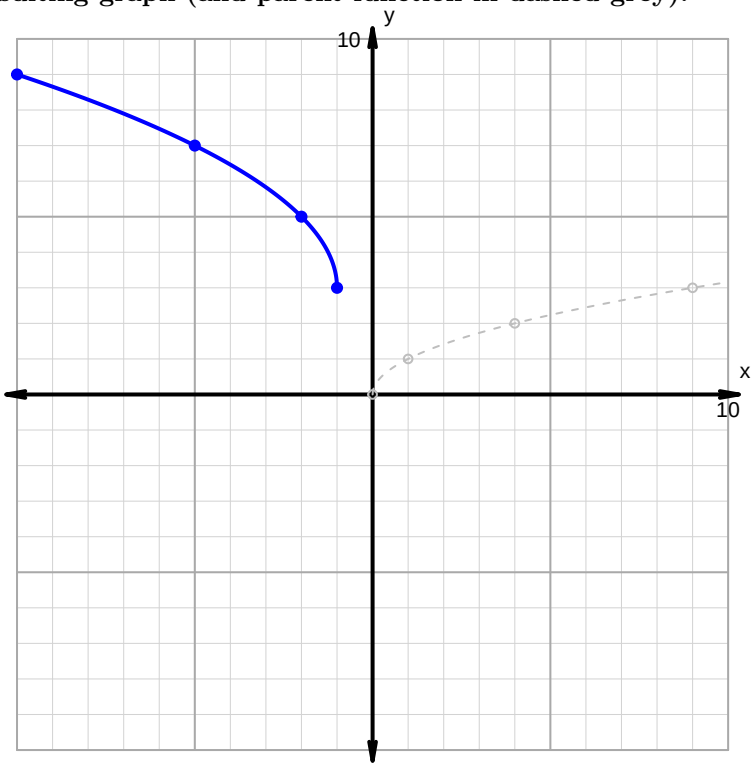
**Horizontal transformations**

1. Horizontal reflection over $y$ axis.
2. Translate left by distance 1.

**Vertical transformations**

1. Vertical stretch by factor 2.
2. Translate up by distance 3.

**Resulting graph (and parent function in dashed grey):**

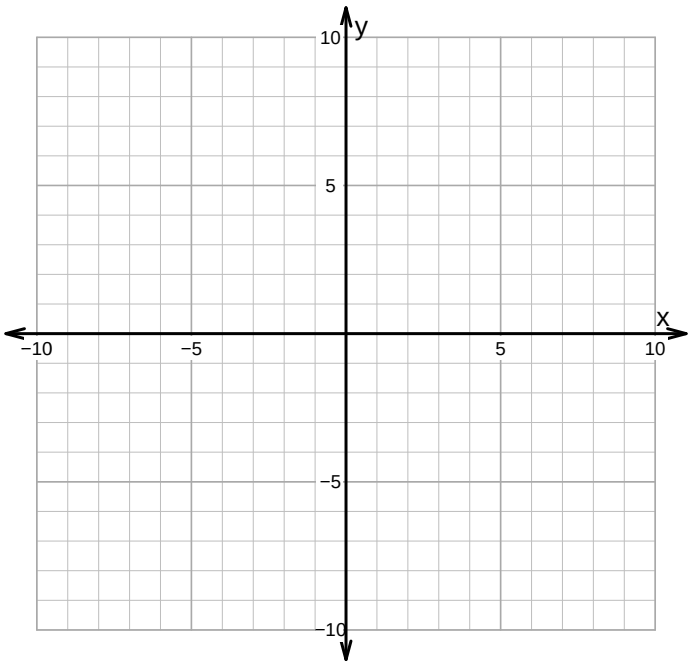



- What is the equation for the curve shown above?

**Question 6**

Make an accurate graph, and describe locations of features.

$$y \;=\; -3 \cdot |x - 5| + 9$$




| Feature | Where |
|---|---|
| Domain | |
| Range | |
| Positive | |
| Negative | |
| Increasing | |
| Decreasing | |